SPECIFICATION

TITLE

RISER ASSEMBLY

BACKGROUND OF THE INVENTION

[0001] The field of the present invention is risers and clamps therefor.

[0002] Traditionally fire sprinkler systems in buildings have employed steel pipe. Steel pipe risers in such sprinkler systems are typically supported on each floor of the building. Figure 1 illustrates a conventional riser clamp which is tightened about a riser using fasteners to either side of the cylindrical portion defined by two hemicylindrical sections. The straight sections to either side of the hemicylindrical portion extend for a substantial distance. This extension is to insure that both straight sections of the clamp will extend to the floor for support around a hole created for passage of the riser therethrough. The fasteners are typically tightened to give very substantial compressive stress in order that the friction between the clamp and the heavy steel riser will retain the riser in place. To obtain such compression, the clamps are defined for use with riser pipes of diameters such that the sections never fully close into juxtaposition when the fasteners are tightened.

[0003] CPVC is now employed in fire sprinkler systems in many smaller structure environments. CPVC pipe is far more fragile than steel pipe and also lighter in weight. A nominally four inch diameter SDR 13.5 BlazeMaster® CPVC pipe is 7.986 lbs. per

foot when water filled. Conventional clamping devices such as illustrated in Figure 1 can allow excessive compression and gouging of the CPVC material.

SUMMARY OF THE INVENTION

[0004] The present invention is directed to a riser clamp composed of two bars with each including a substantially hemicylindrical section and straight sections to either side thereof. Fasteners are extendable through through holes to retain the two bars together with the straight sections to either side of the hemicylindrical sections juxtaposed with one another, respectively.

[0005] In a first separate aspect of the present invention, the riser clamp is for a fragile pipe of a specified outside diameter. The hemicylindrical sections of the two bars define an inside diameter. This inside diameter is smaller than the specified outside diameter of the fragile pipe by not to exceed 5% with the straight sections of the two bars juxtaposed with one another.

[0006] In a second separate aspect of the present invention, the straight sections on each of the two bars include a long straight section and a short straight section such that the long section from each bar is assembled in juxtaposition with a short straight section of the other bar. The hemicylindrical sections of the two bars define an inside diameter. This inside diameter is smaller than the specified outside diameter of the fragile pipe by not to exceed 5% with the straight sections of the two bars juxtaposed with one another.

[0007] In a third separate aspect of the present invention, a riser assembly includes the clamp of the foregoing separate aspects with a fragile pipe.

[0008] In a fourth separate aspect of the present invention, any of the foregoing aspects are contemplated to be employed in combination to greater advantage.

[0009] Accordingly, it is an object of the present invention to provide an improved riser clamp for fragile riser pipe. Other and further objects and advantages will appear hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] Figure 1 is a plan view of a prior art riser clamp.

[0011] Figure 2 is a perspective view of a riser clamp with a riser illustrated in phantom.

[0012] Figure 3 is a cross-sectional end view of a bar of a riser clamp taken through the hemicylindrical section.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0013] Turning in detail to the Figures, a riser assembly is illustrated in Figure 2 as including a riser pipe 10, illustrated in phantom. The riser pipe is of CPVC which comes in standard outside diameters. Such pipe is fragile, particularly compared to steel pipe. Nominal pipe sizes provide actual outside diameters as follows:

Nominal Pipe Size	Actual Outside Diameter
2 inches	2.375 inches
2-1/2 inches	2.875 inches
3 inches	3.500 inches
4 inches	4.500 inches

[0014] CPVC is now commonly employed for use in residential construction and certain other similar uses. Such pipe is designed to be used with systems where the fire or smoke sensing system activating the sprinklers is quite sensitive. Such systems

are principally used to protect lives rather than property. Because of the low threshold, CPVC is acceptable for fire sprinkler use. However, such pipe is subject to fracture under significant compression and to gouging. Consequently, the installation and support of such material must be carefully accomplished. Among the CPVC piping employed, risers 10 extend vertically from floor to floor. They typically pass through holes located at each floor, providing a convenient location for a riser clamp.

[0015] A riser clamp, generally designated 12, is illustrated in Figure 2 as including two bars 14 and 16. The bars 14 and 16 are held together by two fasteners, each including a bolt 18 and nut 20 threadably mounted on the bolt 18. The bars 14 and 16 are identical but are not mated together in that identity.

[0016] Each bar 14 and 16 is unitary in construction but is discussed as including three sections, a substantially hemicylindrical section 22, a long straight section 24 and a short straight section 26. The section 22 is substantially hemicylindrical in that radiused curves at the terminations of this section do not form a part of a cylinder. Further, the concave surface of the substantially hemicylindrical section 22 is radiused at the inside edges to prevent gouging. The inside surface 28 illustrates the break at each edge in Figure 3.

[0017] The long straight section 24 has a length which is greater than the radius of the hemicylindrical section 22. This insures that the clamp 12 can span across the hole in the floor to contact and rest upon the upper surface of the floor through which the riser pipe 10 extends and on top of which the riser clamp 12 is positioned. There is a through hole which is closely spaced from the substantially hemicylindrical section 22 to receive the bolt 18. Near the outer edge, an attachment hole 32 provides the

versatility to attach the riser clamp 12 to a convenient framing member or anchor. This attachment hole 32 is closely spaced from the distal end to provide adequate reach to a framing member. Other holes may be added where appropriate.

[0018] The short straight section 26 also includes a through hole which is closely spaced from the hemicylindrical section 22. The through holes are equidistant from the hemicylindrical section 22. This placement allows alignment between the bars with the through holes as illustrated in Figure 2 and provides a substantially uniform clamping about a riser pipe 10.

[0019] The bars 14 and 16 are assembled together as illustrated in Figure 2. The bolts 18 and nuts 20 retain the riser clamp 12 in the assembled state with the bars 14 and 16 juxtaposed with the long straight sections 24 of each of the bars 14 and 16 being assembled with the short straight sections 26 as shown. The assembled riser clamp 12 is sized such that the hemicylindrical sections 22 define an inside diameter which is smaller than the outside diameter of a specified standard CPVC pipe outside diameter by not to exceed 5%. This is to be with the straight sections juxtaposed. Such sections may include additional plates or washers about the through holes as part of the straight sections to define this specific size relationship between the inside diameter of the riser clamp 12 and the outside diameter of the riser pump 10. Thus, the riser clamp 12 as applied to a riser pipe 10 will not crush the fragile pipe and further will not gouge the pipe at a sharp edge.

[0020] Thus, an improved riser clamp 12 is disclosed. While embodiments and applications of this invention have been shown and described, it would be apparent to those skilled in the art that many more modifications are possible without departing from

the inventive concepts herein. The invention, therefore is not to be restricted except in the spirit of the appended claims.